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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
SANTOS, JOSEPH M	
ART UNIT	PAPER NUMBER
4155	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/599,487	YAMAMOTO ET AL.	
	Examiner	Art Unit	
	JOSEPH SANTOS	4155	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 September 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 September 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *04/20/2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Claims

1. This action is in reply to the Application filed on 09/29/2006.
2. Claims 1-11 are currently pending and have been examined.

Information Disclosure Statement

3. The Information Disclosure Statement filed on 04/20/2007 has been considered. An initialed copy of the Form 1449 is enclosed herewith.

Priority

4. Applicant's claim for the benefit of PCT/JP05/05855 filed on 03/29/2005 and claims foreign priority to foreign application 2004-099297 filed on 03/30/2004. Priority claim benefit under 35 U.S.C. 110(e) or under 35 U.S.C. 120, 121, or 365(c) is acknowledged.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 11 is rejected under 35 U.S.C 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
7. It is not clear what the applicant is claiming. For example, is the applicant claiming the function of the code or the code itself?

Claim Rejections - 35 USC § 101

8. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

9. Claim 11 is/are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. A claimed process is eligible for patent protection under 35 U.S.C. § 101 if:

"(1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing. See Benson, 409 U.S. at 70 ('Transformation and reduction of an article 'to a different state or thing' is the clue to the patentability of a process claim that does not include particular machines.'); Diehr, 450 U.S. at 192 (holding that use of mathematical formula in process 'transforming or reducing an article to a different state or thing' constitutes patent-eligible subject matter); see also Flook, 437 U.S. at 589 n.9 ('An argument can be made [that the Supreme] Court has only recognized a process as within the statutory definition when it either was tied to a particular apparatus or operated to change materials to a 'different state or thing' '); Cochrane v. Deener, 94 U.S. 780, 788 (1876) ('A process is...an act, or a series of acts, performed upon the subject-matter to be transformed and reduced to a different state or thing.').7 A claimed process involving a fundamental principle that uses a particular machine or apparatus would not pre-empt uses of the principle that do not also use the specified machine or apparatus in the manner claimed. And a claimed process that transforms a particular article to a specified different state or thing by applying a fundamental principle would not pre-empt the use of the principle to transform any other article, to transform the same article but in a manner not covered by the claim, or to do anything other than transform the specified article." (In re Bilski, 88 USPQ2d 1385, 1391 (Fed. Cir. 2008))

10. Claim 11 is not tied to a particular machine or apparatus nor do they transform a particular article into a different state or thing, thereby failing the machine-or-transformation test; therefore, claim 11 is non-statutory under § 101.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a

patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

102 Rejections

12. Claims **1, 4, 6, 7, 10** are rejected under 35 U.S.C. 102(b) as being anticipated by Grimson et al. (US 5,999,840).

CLAIM 1 –

As per claim 1, Grimson et al. teaches a first acquisition means that optically measures a surface of an operation site during surgery and that acquires first position information representing a three-dimensional position of each of points on the surface of the operation site (Fig. 1 element 116 and Column 5, lines 38-42.

Grimson et al., further teaches a second acquisition means that measures an unexposed portion of the operation site (Fig 1, element 106 and Column 4, lines 52-57) with ultrasonic waves (Column 5, lines 29-37) during surgery and that acquires second position information representing a three-dimensional position of each of points in the unexposed portion of the operation site (Column 5, lines 22-24, " ... the sample grid is converted into a 3D measurement")

Grimson et al., further disclose correction means that, based on the first position information acquired by said first acquisition means and the second position information acquired by said second acquisition means, estimates displacement and distortion at each of the points in the operation site using a three-dimensional model generated based on a plurality of high-definition tomographic images (Column 3, lines 24-27, " a patient requiring surgical therapy is initially scanned by a three-dimensional, high resolution, internal anatomy scanner") of the operation site, which images are taken before surgery (Column3, line 50,

"The patient is then placed in an operating room"), and that corrects the plurality of high-definition tomographic images.

Grimson et al. teaches a 3D reconstruction model based of the tomographic images is created and referred as the "model" (Column 2, lines 46-48). In addition, Grimson et al. teaches a data registration system to aligned a first data set (3d tomographic images), a second data set (images from element 116) and a third data set (images from element 106) to generated a matched image data in which all three images coordinate frames are aligned with one another (Column 2, lines 9-23).

Examiner Note: The examiner interprets "correction means" as the registration of the images.

Grimson et al., further teaches a display control means that allows the high-definition tomographic images corrected by said correction means to be shown on display means (Fig. 1 element 126 and Column 7, lines 50-53).

CLAIM 4 –

As per claim 4, Grimson et al. teaches the method/system of claim 1 and further discloses the limitations of said second acquisition means (Fig 1, element 106) comprises a probe (Fig 1, element 110) that transmits ultrasonic waves to the operation site and receives ultrasonic waves reflected by the points in the unexposed portion of the operation site, and conversion means that converts the ultrasonic waves received by the probe to tomographic images, and said second acquisition means is provided so as to acquire the second position information by obtaining the three-dimensional position of each of the points on the ultrasonic tomographic images obtained by said conversion means (Column 5, lines 29-36).

Grimson et al. disclose the element 116 could be the same as laser scanning unit 110 (Column 5, lines 40-42) which the laser scanning unit " uses this unique mapping between image plane points and 3d points in space to determine the 3D coordinates points on the surface of the patient's skin" (Column 5, lines 16-19).

The laser scanning unit could be an ultrasound 3D system (Column 5, lines 29-36).

CLAIM 6 –

As per claim 1, Grimson et al. teaches the method/system of claim 1 and further discloses the limitations of the high-definition tomographic image is an MRI image produced by nuclear magnetic resonance-computed tomography (Column 3, lines 24-27).

CLAIM 7 –

As per claim 1, Grimson et al. teaches the method/system of claim 1 and further discloses the limitations of said correction means corrects, based on the first position information acquired by said first acquisition means and the second position information acquired by said acquisition means, a position of a portion whose three-dimensional position is known by the first position information and the second position information in the three-dimensional model of the operation site, and thereafter, estimates displacement and distortion at a portion whose three-dimensional position is not known in the three-dimensional model of the operation site, by means of a finite element method or a method similar thereto, and based on the estimated result, recorrects the three-dimensional model of the operation site, and further based on the recorrected three-dimensional model of the operation site, carries out correction of the plurality of high-definition tomographic images.

Grimson et al., teaches a correction transformation that include data points from the imaging means 1 (element 116) and 2 (element 106) in which they are register with one another (Column 8, lines 52-60). The output of this registration is applied to all the data in the transformation stage 213 (Column 10, lines 17-20) and the final stage of the process the transformation has brought the model into alignment with the actual position takes as input a transformed model of the patient's anatomy in which the transformation step has brought the model into

alignment with the actual position of the patient in the laser coordinate frame and video view of the patient taken from the laser camera 110. (Column 10, lines 30-35). In addition, after the 3D model is updated the invention of Grimson et al., teaches the extension of the system which include the re-registration of the video image of the patient to the 3D tomographic image as the patient moves, this way Grimson teaches a cycle comprising the steps of registration of the images, then the updating of the model, following by a re-registration of the images.

CLAIM 10 –

As per claim 10, Grimson et al. teaches the method/system of claim 1 and further discloses the limitations of a first step in which based on a plurality of high-definition tomographic images of an operation site taken as an image before surgery: a three-dimensional model of the operation site is generated
Grimson et al. teaches a tomographic image of the patient is taken (Column 3, lines 23-26) and based on these images, a three-dimensional model of the operation site is generated (Column 3, lines 46-48).

Grimson et al., further teaches a second step in which a surface of the operation site is optically measured during surgery, so as to acquire first position information that represents a three-dimensional position of each of points on the surface of the operation site, (Fig.1 element 116 and Column 5, lines 38-42) and an unexposed portion of the operation site (Fig.1, element 106 and Column 4, lines 52-57) is measured with ultrasonic waves during surgery (Column 5, lines 29-37), so as to acquire second position information that represents a three-dimensional position of each of points of the unexposed portion in the operation site ((Column 5, lines 22-24).

Grimson et al., further teaches a third step in which based on the first position information and the second position information acquired by said second step,

displacement and distortion at each of the points in the operation site are estimated using the three-dimensional model generated by said first step,

Grimson et al. teaches a 3D reconstruction model based on the tomographic images is created and referred as the "model" (Column 3, lines 46-48). In addition, Grimson et al. teaches a data registration system to aligned a first data set (3d tomographic images), a second data set (images from element 116) and a third data set (images from element 106) to generated a matched image data in which all three images coordinate frames are aligned with one another (Column 2, lines 9-23).

and in accordance with the estimated displacement and distortion at each of the points in the operation site, the plurality of high-definition tomographic images of the operation site taken as images before surgery are corrected

Grimson et al., teaches a correction transformation that include data points from the imaging means 1 (element 116) and 2 (element 106) in which they are register with one another (Column 8, lines 52-60). The output of this registration is applied to all the data in the transformation stage 213 (Column 10, lines 17-20) and the final stage of the process the transformation has brought the model into alignment with the actual position takes as input a transformed model of the patient's anatomy in which the transformation step has brought the model into alignment with the actual position of the patient in the laser coordinate frame and video view of the patient taken from the laser camera 110. (Column 10, lines 30-35). In addition, after the 3D model is updated the invention of Grimson et al., teaches the extension of the system which include the re-registration of the video image of the patient to the 3D tomographic image as the patient moves, this way Grimson teaches a cycle comprising the steps of registration of the images, then the updating of the model, following by a re-registration of the images.

Finally, Grimson et al., further teaches a fourth step in which the high-definition tomographic images corrected by said third step are shown on display means (Fig. 1 element 126 and Column 7, lines 50-53).

Patents are relevant as prior art for all they contain and are not limited to their preferred embodiments. (See MPEP §2123 and In re Heck, 699 F.2d 1331, 1332-33, 216 USPQ 1038, 1039 (Fed. Cir. 1983) and Merck & Co. v. Biocraft Laboratories, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989)).

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

14. The factual inquiries set forth in Graham v. John Deere Co., 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

103 Rejections

15. Claims **2, 3, 5, 8, 9, 11** are rejected under 35 U.S.C. 103(a) as being unpatentable over Grimson et al. (US 5,999,840).

CLAIM 2 –

As per claim 2, Grimson et al. teach/es all the limitations in claim 1. Grimson et al. further teaches a first means for acquisition (Fig.1 element 116) which could be the same mean as laser camera 110 (Column 5, lines 40-43). Grimson et al. further teaches element 110 scan the surface of the operation site with laser light, and detecting means and receiving laser light reflected by the surface of the operation site, thereby detecting a three-dimensional position of a portion on which the laser light is irradiated, on the surface of the operation site, and an operation of detecting the three-dimensional position by said detecting means is carried out repeatedly while scanning each of the points on the surface of the operation site with laser light, thereby acquiring the first position information. *Grimson et al. disclose a laser light reflected on the surface of the operation site for detecting a 3D position from the irradiated light from the surface (Column 5, lines 16-24, "The laser scanning unit uses this unique mapping between image plane points and 3D points in space to determine the 3D coordinates points on the surface of the patient's skin illuminated by the laser. When the laser is moved, a different cross-section of the skin under the scanner can be measured. With multiple scans and the acquisition of multiple points within each scan, a sample grid is converted into 3D measurements".*

Grimson et al. does not explicitly teach the laser unit is mounted on a surgical probe

Grimson et al. further teach/es that images are combined with a surgical microscope or transparent imaging panel on order to augment the line-of-sight view of the surgeon with the MRI data (Column 4, lines 12-16).

It would have been obvious to one of ordinary skill in the art at the time of the invention to expand the system/method of Grimson et al. to place the scanning unit for the first acquisition in a surgical probe. One of ordinary skill in the art at

the time of the invention would have been motivated to expand the system/method of Grimson et al. to provide a surgical imaging method and system which generates real-time, adaptive, enhanced visualizations of the patient in the operating room (Column 1, lines 61-64).

CLAIM 3 –

As per claim 3, Grimson et al. teach/es all the limitations in claim 1. Grimson et al. further teaches said first acquisition means (Fig 1. element 116) further comprises image pickup means (*Examiner Note: Examiner interpret "image pickup means" as a mean able to obtain images)* producing images of the surface of the operation site (Column 5, lines 16-24), and said correction means is provided so as to estimate displacement and distortion at each of the points in the operation site also using images produced by said image pickup means.
Grimson et al. teaches a data registration system to aligned a first data set (3d tomographic images), a second data set (images from element 116) and a third data set (images from element 106) to generated a matched image data in which all three images coordinate frames are aligned with one another (Column 2, lines 9-23).
Examiner Note: The examiner interprets "correction means" as the registration of the images.

Grimson et al. does not explicitly teach the laser unit is mounted on a surgical probe

Grimson et al. further teach/es that images are combined with a surgical microscope or transparent imaging panel on order to augment the line-of-sight view of the surgeon with the MRI data (Column 4, lines 12-16).

It would have been obvious to one of ordinary skill in the art at the time of the invention to expand the system/method of Grimson et al. to place the scanning

unit for the first acquisition in a surgical probe. In addition, the system of Grimson et al. teaches a way to acquire an image with a first acquisition mean, correct it through registration and this correction estimate and perform a displacement and distortion step of each of the points of the operation site in the images acquired. One of ordinary skill in the art at the time of the invention would have been motivated to expand the system/method of Grimson et al. to provide a surgical imaging method and system which generates real-time, adaptive, enhanced visualizations of the patient in the operating room (Column 1, lines 61-64).

CLAIM 5 –

As per claim 5, Grimson et al. teach/es all the limitations in claim 4. Grimson et al. further teaches a said first acquisition means comprises a scanning device (Fig 1, element 116),

and scanning the surface of the operation site with laser light and detecting means and receiving laser light reflected by the surface of the operation site, thereby detecting a three-dimensional position of a portion on which the laser light is irradiated, on the surface of the operation site.

Grimson et al. further teaches a first means for acquisition (Fig.1 element 116) which could be the same mean as laser camera 110 (Column 5, lines 40-43). In addition, Grimson et al. further teaches a laser light reflected on the surface of the operation site for detecting a 3D position from the irradiated light from the surface (Column 5, lines 16-24, "The laser scanning unit uses this unique mapping between image plane points and 3D points in space to determine the 3D coordinates points on the surface of the patient's skin illuminated by the laser. When the laser is moved, a different cross-section of the skin under the scanner can be measured. With multiple scans and the acquisition of multiple points within each scan, a sample grid is converted into 3D measurements".

Grimson et al. teaches said first acquisition means also detects the three-dimensional position of the probe of said second acquisition means; and said

second acquisition means obtains, based on the three-dimensional position of the probe detected by said first acquisition means, the three-dimensional position of each of the points on the ultrasonic tomographic image.
Grimson et al. teaches that "Medical instruments may be tracked to align them with predetermined locations as displayed in the enhanced visualization" (Column 4, lines 33-35). In addition, Grimson et al teaches "The position and orientation of a video camera (video camera maybe exchange for a laser camera, Column 5, lines 40-42) relative to the patient is determined by matching video images of the laser points on a object to the actual 3D laser data" (Column 4, lines 3-6).

Grimson et al. does not explicitly teach the laser unit is mounted on a surgical probe.

Grimson et al. further teach/es that images are combined with a surgical microscope or transparent imaging panel on order to augment the line-of-sight view of the surgeon with the MRI data (Column 4, lines 12-16).

It would have been obvious to one of ordinary skill in the art at the time of the invention to expand the system/method of Grimson et al. to place the scanning unit for the first acquisition in a surgical probe. In addition, it would have been obvious to detect the 3D position of the probe of said second acquisition mean and base on that image detect each of the point of the second acquisition means ultrasonic image. One of ordinary skill in the art at the time of the invention would have been motivated to expand the system/method of Grimson et al. to provide a surgical imaging method and system which generates real-time, adaptive, enhanced visualizations of the patient in the operating room (Column 1, lines 61-64).

CLAIM 8 –

As per claim 8, Grimson et al. teach/es all the limitations in claim 4. Grimson et al. further teaches wherein when the plurality of high-definition tomographic images are produced before a surgical operation, at least three first marks are applied on the periphery of the operation site, and at the time of the surgical operation, at least three second marks are applied to the vicinities of the operation site; said first acquisition means further acquires mark position information that represents respective three-dimensional positions of the first marks and the second marks; said correction means carries out, based on the mark position information acquired by said first acquisition means, and positions of image portions corresponding to the first marks on the high-definition tomographic image, alignment of the high-definition tomographic image and the first position information and the second position information.
Grimson et al. teaches "The 3D locations of any table landmarks are also calculated to identify their location relative to the patient. The current MRI or CT scan is automatically registered to the patient skin surface depth data obtained by the laser range scanner. This provides a transformation from MRI/CT to patient. The position and orientation of a video camera relative to the patient is determined by matching video images of the laser points on an object to the actual 3D laser data. This provides a transformation from patient to video camera. The registered anatomy data is displayed in enhanced visualization to "see" inside the patient. In particular, the two previously computed transformations can be used to transform the 3D model into the same view as the video image of the patient, so that video mixing allows the surgeon to see both images simultaneously" (Column 3 line 65 to column 4 line 11).

It would have been obvious to one having ordinary skill in the art at the time of the invention was made to add 3 marks on the periphery of the operation site and at the time of the surgical operation, 3 ore landmarks to the vicinity of the operation site, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617

F.2d 272, 205 USPQ 215 (CCPA 1980). It would have been obvious, to acquire the corresponding portion regarding the first three marks on the tomographic MRI image and further the registration of the tomographic image, the first position information and the second position information as disclose by Grimson et al. One of ordinary skill in the art at the time of the invention would have been motivated to expand the system/method of Grimson et al. to provide a surgical imaging method and system which generates real-time, adaptive, enhanced visualizations of the patient in the operating room (Column 1, lines 61-64).

CLAIM 9 –

As per claim 9, Grimson et al. teaches the method/system of claim 1 and further discloses the limitations of operation of acquiring the first position information by said first acquisition means, acquiring the second position information by said second acquisition means, correcting the plurality of high-definition tomographic images by said correction means, and displaying the high-definition tomographic images by said display means is carried out repeatedly during the surgical operation.

Grimson et al. disclose "Extensions of the method and system include adaptively re-registering the video image of the patient to the 3d anatomical data, as the patient moves, or as the video source move" (Column 2, lines 42-45). In addition, Grimson et al. disclose that "Visualization updates are performed by re-registration".

It would have been obvious to one of ordinary skill in the art at the time of the invention to expand the system/method of Grimson et al. to recognize the capability of the system to acquire a first position information, acquire a second position information, correcting the tomographic image and display this image through a re-registration of the images and then a visualization of the tomographic image anatomy One of ordinary skill in the art at the time of the

invention would have been motivated to expand the system/method of Grimson et al. to provide a surgical imaging method and system which generates real-time, adaptive, enhanced visualizations of the patient in the operating room (Column 1, lines 61-64).

CLAIM 11 –

As per claim 11, Grimson et al. teach/es an image data processor (Fig 1. element 118) is an IBM RS6000 or IBM PVS in conjuction with a Sun Sparc 10 (Column 5, lines 48-50). , Grimson et al., shows that the image processor unit 118 is an equivalent structure known in the art. Therefore, because these two elements with embedded programs were art recognized equivalents at the time of the invention was made; one of ordinary skill in the art would have found it obvious to substitute the image processor unit with an embedded program for a "surgical operation program that causes a computer".

The image processor unit 118 is able to function as first acquisition means that optically measures a surface of an operation site during surgery and that acquires first position information representing a three-dimensional position of each of points on the surface of the operation site; second acquisition means that measures an exposed portion of the operation site with ultrasonic waves during the surgery and that acquires second position information representing a three-dimensional position at each of points in the unexposed portion of the operation site, correction means that, based on the first position information acquired by said first acquisition means and the second position information acquired by said second acquisition means, estimates displacement and distortion at each of the points in the operation site using a three-dimensional model generated based on a plurality of high-definition tomographic images obtained before the surgery, and in accordance with the estimated displacement and distortion occurring at each of the points in the operation site, corrects the plurality of high-definition tomographic images of the operation site, which images are produced before the

surgery; and display control means that causes the high-definition tomographic images corrected by said correction means to be shown on display means.

It would have been obvious to one having ordinary skill in the art at the time of the invention was made to recognize the image processor unit has an embedded program that causes the system disclose by Grimson et al. to operate. One of ordinary skill in the art at the time of the invention would have been motivated to expand the system/method of Grimson et al. to provide a surgical imaging method and system which generates real-time, adaptive, enhanced visualizations of the patient in the operating room (Column 1, lines 61-64).

Patents are relevant as prior art for all they contain and are not limited to their preferred embodiments. (See MPEP §2123 and In re Heck, 699 F.2d 1331, 1332-33, 216 USPQ 1038, 1039 (Fed. Cir. 1983) and Merck & Co. v. Biocraft Laboratories, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989))

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOSEPH SANTOS whose telephone number is 571-270-7782. The examiner can normally be reached on Monday through Thursday 7:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, THU NGUYEN can be reached on 571-272-6967. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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